

Step up cleanup, pulp industry told

Environment Ontario will be looking for substantial improvements in pollution control from the pulp and paper industry. Environment Minister William Newman recently told the Canadian Pulp and Paper Association.

He told the association's 1974 Air and Stream Improvement Conference at Toronto that the Ministry recognized the severe economic prob-

lems the industry faced early in this decade. But he added, "economic conditions in the pulp and paper industry have improved greatly and the outlook for the future is very favorable. As a result, I think the pulp and paper industry can afford to step up its pollution abatement program."

The industry has spent \$115 million on pollution control in Ontario between 1960 and

1973, he said. "This is a large sum and one might be tempted to assume that the pollution problems of the industry in Ontario have been mostly resolved. Unfortunately, this is not the case."

He detailed some remaining problem areas: "Even though most mills have installed primary treatment for control of suspended solids, additional controls will al-

most certainly be required at many locations in order to achieve adequate protection of the environment.

"Reductions in five-day BOD will be required at most chemical pulp mills, particularly at the sulphite mills where five-day BOD discharges are extremely large." (BOD is the amount of dissolved oxygen in parts per million, required by organisms for the biochemical decomposition of organic matter present in water.)

He said that the elimination of waste components giving rise to taste and odor in the receiving waters and tainting of fish and the elimination of colored discharges, particularly those associated with kraft mill operations will be required.

He also called for the reduction or elimination of acute toxicity associated with many mill discharges.

"On the air side, particulate emissions and odors are the main cause for concern. Emissions from recovery furnaces, digester operations and evaporator operations will need to be controlled to effect acceptable levels of odors in the vicinity of mills. At sulphite mill locations, sulphur dioxide impingement standards will have to be met," Mr. Newman said.

"In the area of solid waste disposal, tighter controls will be applied to the land disposal of waste materials to minimize contamination potential resulting from this practice.

"To place this industry in a true environmental perspective in the province of Ontario, at the end of 1973, discharges of suspended solids from the pulp and paper industry accounted for approximately 60 per cent of the total discharges of suspended solids from all industries in the province. Similarly, the five-day BOD associated with effluent discharges from the mills accounted for approximately 85 per cent of the total five-day BOD discharges in the province," he said.



WILLIAM G. NEWMAN

On a volume basis, the total combined waste discharges of the industry amounted to 20 per cent of the total waste discharges in the province. "I think these few statistics point up quite readily the magnitude of the environmental task facing your industry in Ontario, and I am sure you readily understand my concerns as Minister of the Environment," Mr. Newman told the conference. "I do not wish to leave the impression that nothing has been done or accomplished in the field of pollution abatement by your industry in Ontario. I believe it fair to say that more has been accomplished in Ontario than in neighboring provinces."

In the early 1960s, the staff of the former Ontario Water Resources Commission undertook detailed surveys of the quantity and quality of liquid waste effluents being discharged from the pulp and paper mills in the province.

In January, 1965, the OWRC issued a directive to the pulp and paper industry. In this document, the commission requested that the industry undertake to reduce the suspended solids contained in its waste discharges to the level of 50 parts-per-million by the end of 1966, and undertake to resolve other problems such as five-day BOD, foam, color, taste, odor and acute toxicity by 1970.

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ENVIRONMENT ONTARIO LEGACY

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A submarine surfacing in Hamilton Harbour?—See pictures, Page 7.

Harbor study report is good news for Hamilton

The future looks bright for Hamilton Harbor, according to a study recently released by Environment Ontario.

The most pressing water quality problems in the harbor are large populations of algae, high concentration of phosphates and low levels of dissolved oxygen in deep waters, according to studies conducted during 1972 and 1973.

The study also confirmed that bacterial levels in the harbor generally exceed those considered acceptable for such recreational activities as swimming.

Heavy metals such as lead, chromium, cadmium, mercury and chlorinated biphenols were encountered in bottom sediment, and investigations are continuing into their

significance on water quality and biological life.

Dr. M. D. Palmer, project director in the Environment Ontario study, said that remedial action for some of the harbor problems could restore water quality to the point where it would support a reasonable fishery in a couple of years.

The Ministry is considering a program of artificially induced destratification—using compressed air to drive oxygen-poor water from the harbor bottom to the surface for replenishment. Experimental programs in destratification have been carried out to restore oxygen for fish in smaller bodies of water. One, an Algonquin Park area lake, has shown a noticeable improvement, while others are still

being assessed.

Dr. Palmer said that if destratification can be applied effectively with some further control and treatment measures, "the bay water could be restored to a quality suitable for recreational use."

Since commencement of the study, abatement programs to substantially reduce the amounts of contaminants discharged from industry and municipal sewage treatment plants have been undertaken. For example, secondary treatment facilities have been incorporated into the Hamilton Municipal Sewage Treatment Plant.

Further improvements will occur with the program of industrial sanitary sewage separation and abatement programs at the other municipal plants. The industrial programs have cost \$47 million to date and are expected to cost an additional \$27 million over the next three years.

Continuing water quality monitoring will indicate the improvements resulting from these programs as well as indicating the necessity of further controls.

The Hamilton harbor study further recommended that all land filling beyond existing agreements be discouraged.

LATE NEWS:

New waste, water plans

A major waste reclamation program for Ontario and a water and sewage treatment system with significant impact on housing development in the regions of York and Durham have just been announced by Environment Minister William G. Newman.

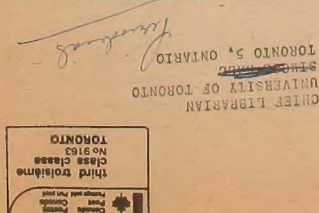
An estimated \$400 million in provincial funds will pour into a program which will convert Ontario's garbage disposal systems into true waste reclamation and recycling programs over the next 15 years, Mr. Newman told the Legislature October 24.

To kick off the program, Environment Ontario has started negotiations with municipal officials for the construction of six waste reclamation plants to serve Kingston, Sudbury, London, and the Peel-Halton-Metropolitan Toronto area.

The York-Durham water and sewage treatment system is expected to provide services for 170,000 new homes in these regions—20,000 by the end of 1976—and a boost in employment for thousands in Ontario, Mr. Newman announced October 21.

"With more than 80 miles of sewage and water mains alone, this is the most comprehensive servicing system ever launched by the Ministry of the Environment," he said.

For more details, see the next issue of Legacy.





Cottagers join in water testing

Cottagers on 150 recreational lakes joined Environment Ontario in a self-help water quality sampling program this year, the Ministry announced today.

This program encourages residents, cottagers and marina and resort owners to be aware of and to understand water pollution problems in our vacation country. In addition, their voluntary assistance to staff of the Ministries of the Environment and Natural Resources contributes materially to the identification and solution of water quality problems.

The first self-help sampling with Secchi discs was done on 12 lakes in 1971. The number of lakes in the testing program has increased steadily every year.

Environment Ontario supplies Secchi discs to cottagers—discs painted with black and white alternating quarters. These are lowered into lake water until they disappear from view and the depth to which they are visible is recorded. In addition, Ministry staff supplies composite sampling devices which are lowered into the lakes to secure chlorophyll *a* samples. Chlorophyll *a*, the green pigment involved in photosynthesis, indicates the amount of algae and therefore the extent of biological activity in a lake at the time of sampling.

Ideally, these samplings are conducted weekly as long as a lake is ice-free and forwarded to Environment Ontario's laboratory in Metropolitan Toronto for analysis. During the winter months, the results of the testing program are summarized and reports prepared which are returned to the individuals participating in the study and released to the public.

Ministry biologists use information gathered from the Secchi discs and chlorophyll *a* sampling in determining the amount of nutrient enrichment in a given lake. With this information, detrimental changes in water quality can be identified and remedial steps taken.

As pointed out above, Secchi disc readings indicate the depth to which light penetrates a lake and chlorophyll *a* is a photosynthetic green pigment in algae. Since

light penetration is affected by algal cells suspended in the water, a good correlation should exist between the depth to which light penetrates and the amount of chlorophyll *a* in a series of lakes of varying degrees of enrichment, assuming that color and suspended particulate materials contribute minimally to light transmission.

Biologists of the Ministry's Limnology and Toxicity Section have noted that a "near-hyperbolic" relationship exists between Secchi disc readings and chlorophyll *a* concentrations. This relationship which is illustrated in Figure 1 (attached) is based on sets of data collected from approximately 187 lakes in the province.

Oligotrophic or nutrient-

poor waters (i.e. lakes Joseph, Rosseau, Superior, Kenosis, Hall's, Big Hawk and Billings) which allow significant light penetration and have low chlorophyll *a* levels lie along the vertical axis of the hyperbola while points for eutrophic or highly enriched lakes (i.e. Riley Lake, Bay of Quinte, Gravenhurst Bay, Lulu Lake and the Western Basin of Lake Erie) are characterized by poor water clarity and high chlorophyll *a* concentrations and are situated along the horizontal limb.

Data for mesotrophic or moderately productive lakes (i.e. Lakes Muskoka, Little Straggle, Pigeon, Chemung, Sturgeon and Little Glamar) are dispersed about the middle section of the curve.

The curve is most useful in

reflecting water quality improvements or impairment. For example, in 1971 Little Otter Lake was characterized by mean Secchi disc values and chlorophyll *a* concentrations of 1.0 meters and 31.2 micrograms per liter, respectively; the lake was akin to a can of green paint. Following elimination of a significant proportion of the total artificial phosphorus loading to the system (phosphorus is considered to be a key nutrient contributing to algal production in most freshwater systems), spectacular water quality improvements materialized in the lake.

These changes are clearly apparent with the relationship as Little Otter Lake moved along the curve from a highly enriched lake (Number

29) to a decidedly improved position (Number 30).

Similarly, and considering the self-help program, the curve should be extremely useful in assessing whether or not detrimental changes in water quality are materializing so that remedial measures could be implemented before lake quality conditions become critical.

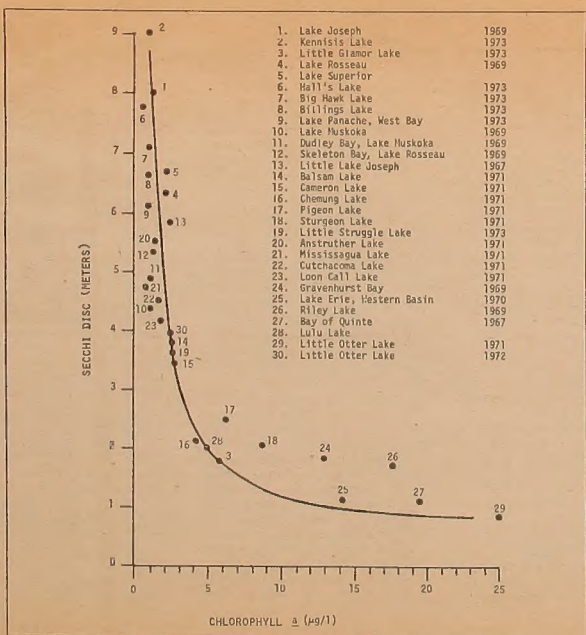
This year's initial report entitled "Enrichment Status of Thirty-Five Lakes in the Haliburton Highlands Region" has recently been released by staff of the Ministry. In general, the biological quality as indicated by Secchi disc—chlorophyll *a* measurements was excellent. However, some concern was expressed relative to the occasionally high levels of algae encountered in Big Straggle, George's and Little Glamar Lakes.

For lakes having two to three consecutive years of data, only minor positional changes in Secchi disc—chlorophyll *a* relationships were noted, indicating that evidence of accelerating enrichment is not yet apparent. The report suggested that in order to maintain the excellent water quality which exists throughout much of the Haliburton Highlands area, every effort should be made to ensure that nutrients from sink and laundry wastes, septic tank seepage and garden fertilizers do not gain access to the lakes.

All these reports now contain a section entitled "Information of General Interest to Cottagers" which personnel of the Ministry hope will be widely read and serve as a useful reference on such topics as natural lake processes, boating regulations, water treatment and septic tank installations.

Individuals requiring additional information on the Secchi disc—chlorophyll *a* self-help program or copies of the Haliburton Highlands study are requested to write to:

Ontario Ministry of the Environment
Water Resources Branch
Limnology & Toxicity Section
P.O. Box 213
Rexdale, Ontario
M9W 5L1
(telephone 248-3058)



The graph shows the relationship between Secchi disc and chlorophyll *a* for a number of well-known lakes in Ontario. The position on the curve shows the relative status of enrichment of the lakes.

Weed-pulling is one step to a better Little Lake

Every three weeks, since May, a truck and boat trailer have been pulling up to the beach at Midland Park Lake. Two very tanned men jump out and, with the help of every small boy on the beach, quickly load a small motor boat with all sorts of curious paraphernalia.

From the shore, interested bathers watch the now familiar strangers drop anchor, lower equipment over the side, don scuba gear and disappear from sight. Eventually, the divers reappear with bags of weeds, return to the shore, unload with the assistance of their pint-sized flandub and drive away to return again—in three weeks.

These men, working for the Ministry of the Environment's Central Region surface water group, are carrying out a complete environmental assessment of the lake.

Midland Park Lake, or Little Lake, as some call it, is a small, shallow lake within the town. The lake, because of its location, sandy bottom and shoreline, has a substantial recreation use. The north and east sides boast a public beach, a trailer park, cottages and several permanent residences. The south and west ends are basically undeveloped.

COUNCIL WORRIED

The Council for the Town of Midland has been concerned about the water quality of the lake, and specifically about the possibility that proposed development in the area may result in degraded water quality conditions. There are already two storm sewers flowing into the lake.

At the request of the Town Council, the Ministry agreed to carry out a study during

1974 to provide advice.

To obtain a general assessment of the ecology of the lake, basic physical-chemical and biological information is collected every three weeks. Four locations are sampled—one near the middle of the lake, one near the undeveloped southwest corner and two near the storm sewers. Information is gathered on such things as dissolved oxygen, phosphorus, turbidity, temperature, transparency, chlorophyll, phytoplankton and bacteria.

The density and species composition of the aquatic weeds are also mapped.

MANAGEMENT PLAN

The Ministry of Natural Resources has agreed to carry out a brief investigation of the fish population in order to "round out" the ecological assessment.



A Ministry diving team studies Midland Park Lake.

The end result of the study will be a management plan which can be implemented by Midland to maintain suitable water-quality conditions in the lake.

Midland's Little Lake problem

is a common one with many small lakes in Southern Ontario. Hopefully, the results of information obtained from this study can be used to maximize public enjoyment of other lakes.

Action plan: total look at resources

Ontario must take a new look at natural resources in the clear knowledge that they are not limitless, a provincial study group advised, in a report encompassing a sweeping range of environmental concerns.

Environment Minister William G. Newman, tabling the report in the Legislature, said: "It incorporates recommendations on policies concerning the environment of the future. If accepted as a basis

for future policy, it will be one of the first attempts by any jurisdiction anywhere to recognize the limitations of its resources and conserve them for future generations."

He said later that the report, prepared by the Task Force on the Human Environment as a response to the United Nations Conference in Stockholm, Sweden, in June, 1972, offered good basic guidelines.

"I can see legislation com-

ing out of it eventually, but not immediately," he predicted.

Members from 12 provincial ministries, Ontario Hydro and the Ontario Energy Board worked for a year and a half, under chairman W. A. Stegless of Environment Ontario.

WARNING

"The report warns of our problems from man's unwillingness to accept himself as a part of nature," Mr. Stegless said. "Nature seemed to offer unlimited abundance—science and technology the keys to ever-expanding well-being and comfort for all."

"We are continuing our extraordinary consumption of material wealth at an accelerating pace in the enjoyment of nature's bounty. We continue to believe that we must dominate, subdue and remold nature into forms to serve our purposes."

The Task Force presented the Canadian as a rich man—one who consumes as much as 30 times the energy and resources used by the man in an undeveloped country.

The task force urged Ontario and all levels of government in Canada to pursue policies of economic and social development which address the human environmental problems, created by concentration of population and related imbalance of resource and land use. The report called for "increasing emphasis . . . on the humanizing of urban areas and reduction of growth pressure on metropolitan areas." It mentioned a critical mass for a community beyond which all sorts of environmental problems break down growth.

RECOMMENDATIONS

The task force predicted that the province will have lots of room for 13 million people in the year 2000, but that we need to know more

about grouping people for better living.

In the area of pollution control, the task force recommended that provincial and federal governments should "consider the denial of government contracts, grants or loans to companies convicted of violating anti-pollution legislation in Canada." The report added: "Heavy fines or other forms of punishment should be imposed for littering and illegal dumping or discharging of wastes."

Other pollution control recommendations included:

- Substantial effluent and emission fees to encourage delinquent waste dumpers to comply with pollution abatement schedules.

- Encouraging underwriters to develop insurance against pollution damage as an incentive for the improvement of the design and operation of pollution abatement facilities and systems of recycling industrial pollutants.

- A penalty tax on wastes difficult or impossible to recycle or reuse.

- National objectives for air and water quality, agreed on by the provinces and the federal government.

- Greater attention to the prevention of spills of hazardous substances in addition to the present contingency plans which provide for rapid response to these emergencies.

- Government promotion of the reduction of excessive and wasteful consumption and the manufacture of more durable, recyclable and repairable consumer products to reduce the volume of obsolete wastes.

In its pollution control recommendations, the task force assumed that some "pollution intensive" firms and products would be driven from the market by environmental concern and suggest that government should step in to cush-

ion the blow. It recommends programs of adjustment to relieve social costs in phasing out environmentally obsolete facilities and to retrain and relocate any workers who lose their jobs.

RESOURCES

The task force recommends ecological inventories of given areas before any resource exploitation begins. These inventories would encompass the quality and limitations of the soil, water and general environment as well as recreation needs and facilities and would become tools for zoning and land use planning.

The report indicates concern about the use and waste of energy, four-fifths of which Ontario must import at rising cost as shortages develop. The major solution offered is efficiency—products that use less power, improved public transportation, energy saving building designs induced by better building codes, better energy generating systems and the burning of garbage to make electricity.

The report pictured farmland as a resource of increasing importance, noting that Ontario, which accepts as a matter of course an abundant food supply, is a net importer of food. We can no longer take this abundant supply for granted in a world food shortage with growing populations and shrinking of farm acreage.

Because land reserves, even in Canada, are limited, the report recommends setting aside as much as possible, particularly in areas where native peoples are living in traditional ways or where the biological productivity of the land is a problem.

The report also recommends increased provision for land reclamation in the wake of mining operations, extending to the restoration of abandoned mining operations.

Briefly: Beer, oats and China's air

PORRIDGE POWER

A rolled oats company in New Zealand is using husks from the oats to fire a steam-powered generator for its electricity.

About one quarter of the oats, which go through machines to make products ranging from porridge to baby foods, is discarded as husks. These are carried by pipe to a hopper in the boiler room and fed into a burner.

The system solves the waste disposal problem of the husks and at times produces more power than the company needs. The extra is fed into the national grid system to help ease the country's power shortage.

ENVIRONMENT CHINA

A growing concern for the country's environmental problems has caused China to set up a new government agency, called the Office of Environment Protection.

While Chinese city streets are relatively clean and litter-free compared to many other Asian cities, vehicle pollution is a growing problem. Low-grade fuel, poor maintenance and old engines contribute to this.

There is also heavy pollution in some industrial areas; foreign observers are skeptical about Chinese claims that the problem is under control.

THE BREAK OF THE GAME

While Ontario has a well-developed and sophisticated system for cleaning up spills of hazardous substances, one spill in Metropolitan Toronto was mopped up by eager volunteers before any official measures could be called on.

A tractor-trailer overturned on the Don Valley Parkway at Highway 401 dumping 34,000 bottles of beer on the highway. One smiling member of the cleanup crew commented: "No one likes to think of such an accident, but when it happens, you just make the most of it."



Camps can teach ecology

One of the benefits of sending a child to summer camp is the enormous potential for outdoor education. With its swimming, canoeing and hiking activities, a camp is naturally environment-oriented.

In addition, a camp is a small scale organization. The director and counsellors can easily translate their environmental concerns into daily activities. The campers, themselves, when given proper direction, become interested and concerned, coming up with all sorts of ideas for protecting our environment.

Most camps already have some sort of nature programs. One camp especially strong along environmental educa-

tional lines is Camp Allsaw in the Haliburton area.

Allsaw was set up in 1961 by Sam Hambly, a retired public school principal, who also helped establish the Toronto Island Natural Science School.

The camp features all the regular outdoor skills—swimming, hiking, canoeing, crafts, as well as ecological and conservation activities.

ECOLOGY PROGRAM

Under the ecology part of the program, habitat studies are conducted in a sphagnum moss bog, in a red pine and maple forest, and in fields.

The trip to the swamp involves the campers spending half a day right in the swamp. Curiosity soon overcomes ini-

tial squeamishness and campers discover that a swamp is one of the most active of all habitats.

Samples of swamp findings are brought back to the ecology centre for examination under a microscope.

CONSERVATION PROGRAM

The main activity of the conservation centre has become organic gardening. Growing their own food is a novel idea to most campers but they are usually quite taken aback at the idea of using manure. However, an explanation of the values of the fertilizer and a comparison sampling of store-bought vegetables with those grown in the camp alters their way of thinking.

The camp has set up a small chicken coop to demonstrate the food cycle in miniature and naturally has a compost heap.

Allsaw also produces its own honey. A local beekeeper has set up hives on a plot off the main area of the camp. Several hives are glass-sided for observation purposes. The day the "bee man" comes to draw off the honey is very exciting and means fresh honey for breakfast.

Even the crafts program is aimed at using renewable resources. The variety of tin can paintings is limited only by the imagination of the painters.



Children at Camp Allsaw show off the wall plaques they made from discarded cans (top left), clean table scraps into a bin for use as compost material (above) and start seedlings in pots of composted refuse (below left).

Bruce Peninsula lakes get clean bill of health

Environment Ontario has given a clean bill of health to 11 recreation lakes in the area of the Bruce Peninsula.

The Ministry has revealed that testing for excessive algae and aquatic plant growth in the lakes carried out in 1973 in co-operation with local cottagers and the North Grey Region Conservation Authority has shown that the lakes were found to be only moderately productive.

However, the Ministry advises that the tests, using the simple but effective Secchi disc and chlorophyll a measurements, should be continued so that any change in water conditions might be noted and remedial action taken before critical conditions occur.

These tests consist of lowering a disc, divided into black and white quadrants, into a lake to determine light penetration and thus algae density, and the lowering of an empty bottle to collect water samples at various depths to determine

the amount of chlorophyll a in the lake water. Chlorophyll a is a green pigment found in algae and its density is also an indication of the biological activity within the test lake.

Some lakes in Ontario have been adversely affected by inputs of phosphorus, nitrogen and other dissolved minerals to the point where excessive algae and aquatic plants have contributed to a reduction in the value of the water for recreational purposes.

The report warns that in order to maintain good water quality in the Bruce Peninsula lakes, every effort should be made by cottagers to ensure that nutrients from sink and laundry wastes, septic tank seepage, and garden fertilizers do not gain access to the lakes or area streams.

The report also contains a section entitled "Information of General Interest to Cottagers" which deals with boating regulations, natural lake processes, water treatment, septic tank installations, etc.



Variety is the challenge

From Windsor to Tobemore to the eastern boundaries of Grey, Huron, Perth, Oxford and Elgin, that's Doug McTavish's territory.

Doug was appointed director of the Ministry's Southwestern Region when Environment Ontario reorganized in April of this year.

Reorganization was a major step for the then only two-year-old Ministry. It certainly has meant major changes for the six regional directors responsible for delivering Ministry services to the people of Ontario.

Based in London, Mr. Mc-

Tavish faces the challenge of all aspects of environmental protection in the region.

"The geography and land use patterns alone give variety to my assignment. The region comprises agricultural land, recreational areas and centres of industry, each with differing environmental problems and concerns."

"This is something of a home-coming for me. My first job with the Ministry's predecessor, the Ontario Water Resources Commission, was in the water treatment plant in Union. Subsequently, I was involved to a

great degree in water pollution control in this section of the province.

"This is at the same time an opportunity and a challenge. Regionalization is a new direction for the Ministry, one that's gaining recognition and acceptance with the public, the industries and the municipalities. I feel this will foster understanding and co-operation with our environmental enhancement and protection programs," Mr. McTavish said.

Doug, his wife and four children have recently settled in a new home in London.

He joined the OWRC's plant operations branch in 1959, became a regional supervisor with the branch in 1964 and branch director in 1967.

He was director of the project operations branch of the Ministry from its foundation in 1972 until accepting his present position.

In addition to the head office at 985 Adelaide St. South in London, the Southwestern Region has district offices in Windsor at 1822 Wyandotte St. East, in Sarnia at 242-A Indian Road, and at 1952 Third Ave. East in Owen Sound.



DOUG MCTAVISH

Conference enters second decade

Ontario's Industrial Waste Conference has come a long way from the first edition in 1954 at the then Ontario Agricultural College in Guelph.

The topics covered have expanded from initial examinations of water pollution problems and controls to presentations on all forms of industrial waste.

The first conference took place in prehistoric times as far as pollution control is concerned. Although only 20 years ago on the calendar, this was three years before the founding of the Ontario Water Resources Commission and 18 years before the Ministry of the Environment was established.

"The importance of conferences such as these cannot be over-emphasized in our continuing concern for environmental protection in the face of advancing technology," said K. H. Sharpe, assistant deputy minister of the Ministry's environmental assessment and planning division and chairman of the conference committee.

The three-day conference was opened by deputy minister Everett Biggs who stressed the opportunity for an exchange of information that would benefit all parties involved, speakers and delegates alike.

CITY LIFE

The conference began with Professor E. G. Pleva of the geography department, University of Western Ontario, on land use and its effect on pollution control. His presentation included comments on the quality of life in cities, a prelude to the discussion expected at the upcoming world conference on the human environment to be held in Canada in 1976.

One interesting fact pointed out by Professor Pleva concerned commuting. "Thirty-four minutes is the cut-off point for travelling to or from work. If a person spends longer than that, he is unhappy with the amount of time devoted to going from home to work and back again."

K. A. Oakley, associate director of the International Joint Commission gave a brief history of this organization

and its activities in the field of water resources management.

Monday's afternoon session was devoted to three case histories of specific industrial water pollution problems. L. S. Love of the consulting firm L. S. Love and Associates outlined the efforts made by his company in the design and operation of a multi-stage system for treating waste water at a poultry plant.

SOLUTIONS

T. B. Lynch of Canadian Industries Ltd. described the solution of various environmental problems in the operation of his company's fertilizer complex at Courtright, Ontario. O. E. Kristiansen of Dornier Fine Papers Ltd. gave a report on the progress of a primary waste treatment clarifier at his company's paper mill in Cornwall.

Ontario's experimental waste reclamation plant was the subject of a paper presented by J. K. Walter of Kilborn Engineering, commissioned by the province to design this facility. The 200-ton-per-day reclamation plant will be built adjacent to Metropolitan Toronto's Dufferin Street incinerator in an industrial district in North York.

Management of concentrated liquid waste and solid waste in industry was discussed by O. Martini of James F. McLaren Ltd. and the behavior of leachate at waste disposal sites by J. P. Numan and F. A. Rogers of Hydrology Consultants Ltd. and Dr. G. I. Farquhar of the University of Waterloo.

Tuesday afternoon's meeting began with D. Harrison of Ontario Hydro talking about the control of sulphur dioxide emission from generating stations using fossil fuels. This was followed by a presentation on Inco's sulphur dioxide emission control program by K. Segsworth of the International Nickel Company.

Mr. Segsworth's paper was one of a series on environmental conditions in the Sudbury area. Ministry of the Environment studies and rehabilitation programs in this area were outlined. Nels Conroy, chief of water resources for the Ministry's northeastern region talked about lake studies in the area.



Discussing the day's topics are: Tom Armstrong (left), manager of the industrial abatement section for central Ontario, Betty Hill, senior approvals engineer for the Ministry's northeastern region and consulting engineer Wally Wells.

MINING

Environmental aspects of acid mine wastes were dealt with by M. German of the Ministry's regional operations division. G. R. Craig of the water resources branch looked at toxicity studies performed by the Ministry relating to acidic conditions in lake systems and M. F. P. Michalski, a supervisor with the water resources branch followed this with examples of restoration of acidified lakes in the Sudbury area.

One of the social highlights of the conference, the banquet Tuesday evening, featured D. S. Caverly, chairman of Ontario's Environmental Hearing Board and long associated with the Industrial Waste Conference as guest speaker. He took a nostalgic and amusing look at the locales, facilities and happenings at previous conferences.

Peter Victor of the environmental approvals branch of the Ministry began the final day's program with an explanation of an economic and environmental model for planning and forecasting.

In his after-dinner comments, Mr. Caverly had mentioned that early conferences ranged far and wide to find qualified speakers in a field that was virtually brand new. He looked on the development of a program of "home-grown" speakers as an indication of the progress Ontario has made in pollution control.

IN IRELAND

The only presentation from outside the province at this year's conference was given by W. G. Dallas of Tara Mines Ltd. of Ireland. Mr. Dallas related details of environmental control and public education programs conducted by his company in connection with a new mining operation in the Irish town of Navan.

One of the world's largest deposits of lead and zinc has been discovered virtually next-door to this long-established town of 6,000. The

company is carefully designing its systems and keeping the citizens informed about developments at this massive mining operation.

The final presentation concerned the treatment of oily waste water at the Steel Company of Canada. At the conclusion of the remarks by A. Schuld of Stelco, the twenty-first Ontario Industrial Waste Conference was over.

The consensus of the delegates was that the conference had been extremely worthwhile from an educational and a social standpoint.



W. G. Dallas of Tara Mines Ltd., Ireland, explained the public education programs, conducted by his company, in connection with a new mining operation.

For your information



R. J. (Bob) FREWIN

R. J. (Bob) Frewin has been appointed director of information services for Environment Ontario, G. E. Higham, executive director of the Ministry's finance and administration division announced recently.

Mr. Frewin is responsible for the Ministry's total information services and public relations, including educational programs, advertising, audio-visual productions and publicity.

He brings many years of experience in his new appointment having served as direc-

tor of public relations for two major Canadian companies and as a senior account executive for a leading public relations agency. Prior to entering the public relations field, Mr. Frewin was employed as reporter and editor by a Toronto daily newspaper. Born in Hamilton, Mr. Frewin is a graduate of the University of Western Ontario. He and his wife now live in Willowdale.

Murray F. Cheetham is continuing his long service with the information branch as coordinator of regional information programs and will have

additional administrative responsibilities.

Mr. Cheetham has been director of the branch since 1972. Prior to this, he was director of public relations and information for the Ontario Water Resources Commission for four years. In industry, he was manager of public information services for a company in Toronto from 1959 to 1968. He also worked as an information officer with the federal government in Ottawa for five years.

Ray Gilbert will continue as assistant director.



MURRAY F. CHEETHAM

Minister calls for new vigor in control programs

(Continued from Page 1)

In response to this directive, the industry created a task force which undertook to survey the industry in Ontario to validate the waste discharge figures reported by the OWRC. The results of the task force study indicated that in 1960 the industry discharged

the staggering total of approximately 1400 tons per day of suspended solids to the waters of the province and by the close of 1964, this figure had been reduced to approximately 1000 tons per day. At the present time, the Ministry's most recent data indicate that the discharge of

suspended solids has been reduced to approximately 270 tons per day.

The industry has reduced suspended solids by 1,130 tons per day to the present level of 270 tons per day and reduced its five-day BOD from some unknown level to the present level of approxi-

mately 900 tons per day, Mr. Newman said.

"While significant progress has been made, the discharge of suspended solids has not yet been reduced to acceptable levels and progress in related problems such as color, taste and odor cannot be regarded as adequate.

Perhaps the time has come for us to address ourselves to the task with renewed vigor.

"On the positive side," he said, "research programs have been initiated, treatment works have been planned and installed, processes have been modified to reduce wastes, and considerable money has been spent."

Industry began installing primary treatment systems in the late 1960's and by the end of 1973 most mills had installed basic primary treatment facilities, or were in the process of installing these facilities. Some reduction in five-day BOD was also accomplished during this period, although mainly as a side benefit from the installation of primary treatment facilities.

Markets studied for weed harvest

Ontario's weed-harvesting program on Chemung Lake near Peterborough is expanding into a new area—finding markets for the harvest.

For the past three years, a research program has been carried on in Chemung Lake by the Ministries of the Environment and Natural Resources. It involves the removal of weeds by cutting and mechanical harvesting. (Chemical poisoning as a method of removal is not favored because of the danger to other organisms and because plants treated in this manner decompose to release nutrients which encourage regrowth.)

To offset the expense of the program, this year, scientists from an environmental management consultant company, Limnes Limited, and from the

University of Guelph, in cooperation with the Ministry of the Environment, are investigating the possibility of using the material harvested as animal feed.

They are also composting the plants and testing them as a soil conditioner and nutrient source for garden plants and crops.

The average protein content of the material is similar to that of alfalfa. Difficulties in removing the large water content of the aquatic plants may hinder its use for an animal feed, but it is expected that the composted material will provide an attractive alternative to commercial soil conditioners, such as peat moss and dried manure. Eventually it may prove valuable as a mulching material for field crops.

Water weeds, or macrophytes as they are called, are the biological result of an enrichment of the lakes with the nutrients, phosphorus and nitrogen. The weeds interfere directly with recreational activities such as swimming and boating. During periods of

hot, calm weather and during the winter under ice cover, decomposition of plants may lead to depletions in dissolved oxygen in the water, resulting in periodic fish-kills. Decomposition processes can also cause taste and odor problems in a lake.

Some catch for a dying lake

Erie, the lake that just a few years ago was supposedly dead or dying, continues to be the most valuable commercial fishery in the Great Lakes. Last year about 48.2 million pounds of fish or 48 per cent of the total Great Lakes catch came from Lake Erie.

The waters of the Great Lakes provided U.S. and Canadian commercial fishermen with a catch amounting

to about 111.4 million pounds last year, the highest total since 1969 and 15 per cent above the 1972 poundage. The landed value, aided by increased prices, rose to \$17.7 million, a gain of some 23 per cent over 1972 and 50 per cent higher than the value of the 1970 catch.

These figures are among the findings of the 1973 catch statistics recently completed by the National Marine Fisheries Service office in Ann Arbor and the Ontario Ministry

of Natural Resources.

The leading species of fish caught in the Canadian waters in 1974 was yellow perch at 19,021 pounds. Also caught were smelt, herring, white bass and whitefish, which brought the Canadian catch up to 47,886 pounds.

In the U.S. waters, alewives were the predominant species at 34,198 pounds. The American catch of 63,511 pounds also included chubs, carp, whitefish, smelt, yellow perch and white bass.



Tiny plastic containers are a versatile study aid.

ENVIRONMENTAL STUDIES:

Use packaging waste

By Daniel Stoker
Educational Resources
Co-ordinator

Here's a novel way to make use of some of the packaging waste so common nowadays to caterers.

The plastic containers which hold set portions of jam or marmalade can be put to use in environmental studies.

Right side up the container makes a good dish for sorting organisms, collected in the field. Turned upside down, over a specimen, with a drop of water added to the top surface, and presto you have a hand magnifier.

As a class project, why not have your students check with some of the local cafeterias and restaurants to see what sort of containers they are employing? Arrangements

could be made with the managers of these eating establishments for a mini-recycling program.

Are there any other wastes in the food industry that could be recycled? Teams of four or five students could be left with the task of finding out. Please send along any ideas they come up with.

One manufacturer has given us a limited supply of jam containers. Class sets will be mailed upon request, while the supply lasts.

If you have any novel recycling ideas, require more information or would like a class set of the containers, contact the Educational Resources Co-ordinator, Information Services Branch, Ontario Ministry of the Environment, 135 St. Clair Avenue West, Toronto, M4V 1P5.

Viewpoint—the possible

Where does idealism leave off and reality begin?

H. D. Monteith, regional engineer in the Ottawa office of the Ministry of the Environment, prepared this personal viewpoint of the Art of the Possible. Legacy presents it for your discussion.

It has been said that the Art of the Possible is the trade-off between the ideal and stark reality.

Those who have been engaged in the business of government for any period of time are naturally quite aware of this truism. And, probably, in no other field is the conflict more evident than in the question of the protection and conservation of the natural environment. Examples are endless, but two which have been subject to the glare of considerable publicity can serve to illustrate. One is the wilderness area as exemplified by Algonquin Park, and the other is the so-called recreation water, exemplified by any number of the lakes and rivers of the province.

The Environmental Protection Act of this province states as its purpose that it "is to provide for the protection and conservation of the natural environment". As a philosophy there can be little argument with this but as a practical objective it may border on the pendent.

The question must be asked as to the purpose of this protection and conservation. It is suggested that it is here that the fundamental conflict arises. It is here that must begin the trade-off between the ideal and the stark reality. It is here that compromise must begin. It is here that the practice of the Art of the Possible must begin.

Perhaps, the subject of the use of recreational waters may serve to illustrate. As a starter, what is the objective of protection and preservation with reference to recreational waters?

Perhaps at the risk of oversimplification it is to enable them to continue being used for the benefit and enjoyment of the citizens of

this province. And, right here, the conflict arises.

Different people have different definitions of enjoyment. Some wish peace and quiet, others like motor boat racing. Still others like sailing or fishing.

Some marked problems in compatibility are immediately evident. Then there is the short time user, the camper, versus the permanent user, the cottage owner. These latter, quite understandably, develop a parochial interest in their particular body of water, albeit theirs only because their property fronts on the water.

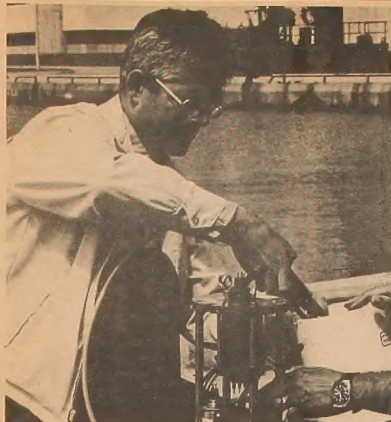
There is the question of the developer and his own particular conflict in the type of development he wishes to pursue. And basic to all this is the capacity of the body of water to accept any or all of the above activities and in what volume.

The technology is at hand to determine the impact of any of the noted activities on the water. But what branch of science can develop a formula for the resolution of the conflicts of interest? Managers have long been aware of the question as to whether their activity is an art or a science.

The consensus is that it is more of an art than a science, primarily because its principal activity involves dealing with the human being. Indeed, as an aside, the historical fact is that labor management relations have inevitably deteriorated when this fact is forgotten. As a further aside, problems also arise for governments when this fact is forgotten.

The point to be made here is that notwithstanding the scientific tools which are presently and will in the future become available, at some point we must look at the options available within the scientifically provided boundaries.

Ideally all activities should be allowed, but facing reality they cannot be. All those then, either interested in or involved in the protection and conservation of the environment, must begin to practise the art of the possible.



Environment Ontario staff adjust instruments and equipment for testing water quality in Hamilton Harbor (above) and launch the torpedo-shaped testing unit (below) to gather data for the Harbor program. See report and picture on Page 1.



Better zoning limits shore damage

Better land-use zoning is the most promising means of reducing property damage by lake waters, says a report of the International Joint Commission on the Great Lakes.

The report, which comments on potential plans for the Great Lakes, was designed to help the layman understand a complex problem, said Commission co-chairmen Christian Herter of the United States and Maxwell Cohen of Canada.

The brief says in part that "the natural balance of the Great Lakes, created over the years, is delicate. To disturb it is to affect lakeshore properties, water supply intake, navigation, power production and the environment."

The commission says that among the various plans being considered, two stand out as being beneficial while costing relatively little.

One plan envisages the regulation of Lakes Superior and Ontario together or the regulation of Lakes Superior, Erie and Ontario as a group. The second plan would increase the flow of water out of Lake Erie when water is higher

than average, using controlled diversion through the Black Rock canal that parallels the upper Niagara. It would also require modification of present Lake Ontario regulation.

The former plan would give benefits totalling about \$2.37 million annually for a cost of about \$70,000 a year, the commission said. The latter would cost less than \$500,000 a year while providing benefits totalling about \$8.8 mil-

lion annually.

But without proper zoning of the lakeshores, the benefit from either plan would be reduced. There should be a concerted program of zoning and setback requirements based upon the realities of natural lakeshore processes, says the commission.

Lakeshore development was pushed as near the water as possible during the mid-60's disregarding the fact that

the land had been flooded only a few years before and that the lakes were at record low levels.

The commission plans public hearings on control proposals in late October and through November in Thunder Bay, Owen Sound, Sault Ste. Marie, Hamilton and Montreal as well as in Milwaukee, Duluth, Muskegon, Detroit and Rochester. Dates are to be announced soon.

New directors for finance, internal audit



HELEN VANNER

Ernest F. Heath has been appointed director of the internal audit branch and Helen A. Vanner, director of financial services. G. E. Higham, executive director of Environment Ontario's finance and administration division recently announced.

Ernest Heath is a chartered accountant and brings significant experience to his new position. He joined the Ontario Water Resources Commission in 1961 as an accountant, rose to the position of director of finance and continued in this capacity when the OWRC became part of the

Ministry of the Environment in 1972. He has also worked in other government departments and in industry. Mr. Heath and his wife have three children and live in Scarborough.

Helen Vanner has been assistant director of the financial services branch since 1972. Before joining the Ministry, she worked in the province's Department of Health. For eleven years she was chief accountant at United Dominions Corp., Canada Ltd. Mrs. Vanner is a certified general accountant and she lives in Toronto.



E. F. HEATH



A member of Environment Ontario's biology staff explains the Sudbury water program to a visitor.

OPEN HOUSE:

Sudbury work on display

Some unusual studies into the problem of reduced fish production associated with the acid lakes in the Greater Sudbury Area are now taking place.

The studies, which form an

integrated part of the Ministry of the Environment's Sudbury environmental program, involve the chronic exposure of American flagfish to a wide range of acid conditions, and an examination of their reproductive success at each level.

Information collected to date indicates that numerous lakes near Sudbury are extremely acidic and declining fisheries are the unfortunate result. However, high levels of dissolved metals, such as zinc and copper detected in some waters, add to the difficulty of sorting out the factors responsible for changes in fish species and numbers.

The quality of the lakes in the area also varies. Natural factors such as background geology, size, depth, watershed area and the presence or absence of inflows and outflows apparently influence the input of sulphuric acid, from sulphur dioxide in the atmosphere and from other airborne contaminants.

It is hoped that when the factor causing the decreasing fish populations is determined,

remedial action can be taken to reclaim the lakes. Initial results suggest that lime treatment is particularly attractive as a simple, effective and relatively inexpensive water management tool for restoring acidified lakes so that sports fish may exist.

On the weekend of July 20 and 21, an open house was held at the field toxicity laboratory. The laboratory is located at the Ministry of Natural Resources deputy forest ranger station on Lake Panache, 15 miles west of Sudbury.

More than 300 visitors toured the site to learn what the Ministry of the Environment was doing in the Sudbury area. Ralph Moore, Regional Director for North-eastern Ontario was at the experimental station on the Saturday and was impressed with the enthusiasm and relevancy of the public's interest.

Mike Michalski and Nels Conroy, two of the biologists responsible for the program, were happy with the effort. "This was our first attempt at this type of educational program and it has proved to us that the people want to know what is going on and are most willing to help in any way they can. The local cottagers and residents have given our program a big boost with their support," they said.

One happy visitor said, "We expect this kind of program to be maintained and expanded. My family and I were very impressed. Our guide was well-informed. Keep up the good work."

EcoLogic

Toward environmental action

The ideals and recommendations of the Ontario Task Force on the Human Environment are outlined in this introduction to its report, *Toward an Environmental Action Plan*. The report was offered as a guideline for future environmental policies and as Ontario's contribution toward the development of long-range national environmental planning.

Many of man's present environmental problems, particularly in this western hemisphere, stem from his unwillingness to accept himself as a part of nature.

Historically, his attitude towards nature has been one of conflict, rather than co-operation. He has seen his role as one in which he must have dominance over nature; nature must be subdued and molded into forms which will serve his purposes.

Only recently has western man come to glimpse the fallacy of this belief and to understand the consequences of his acting apart from nature. It is perhaps one of the greatest paradoxes of our time that the very progress achieved by man in the technological and social fields, which was originally intended to improve his standard of living, now poses serious challenges to the well-being of present and future generations.

Man is now becoming aware that all the progress and growth of modern economic life have been accomplished by the plundering of a finite environment and the earth's resources are in danger of running out under the pressure of this economic growth.

Dramatic increases in population, technological development and industrial expansion have resulted in the balance between man and nature becoming upset. Natural forces are no longer able to keep in order the animal and vegetable resources of the earth. The resources of air and water and productive soil are likewise threatened because nature has not been able to keep control in competition with our increasing technical skills.

It has now become abundantly clear to us that the earth's space and resources are limited and that a crisis of considerable proportions faces us at the present time.

In lesser developed parts of the world, environmental problems pale beside those of poverty, malnutrition and illiteracy.

We have finally become aware that to meet the ecological crisis we must abandon some of our basic human ideas — the desirability of fertility and of population expansion, the worship of economic growth at all costs, the tendency of our culture to become more industrialized, urbanized and centralized — and develop instead a whole new set of attitudes which will restore harmony between man and the world around him.

In order to narrow the gaps between developed and developing countries, the nations of the world must develop or maintain their economic and social strengths as well as capacities to adopt and use environmental technology.

The colossal growth in population is of particular significance for the quality of man's environment — particularly in light of current estimates, that world populations will double by the end of this century.

For most of the time that man has existed on this earth, his numbers have been relatively small. Damage to the environment remained local and well within the assimilative

capacity of his surroundings. But then, human populations began to soar. Coupled with the more rapid growth in population, the trend to increased urbanization began to accelerate, together with expanding economic activity.

Traffic congestion, noise, air and water pollution all tend to increase with increases in the size of our cities. Recreation areas become overtaxed and privacy diminishes. Facilities for solid waste disposal become overburdened and expenditures increase in enlarging these facilities or in finding alternatives for them.

In short, the amenities of life become harder to obtain and considerably more costly.

Furthermore, as world populations grow, there is increasing apprehension concerning the dwindling supply of land and the natural resources needed to satisfy the demand occasioned by more people. In addition, expanding technological systems consume scarce resources at an unsustainable rate and at the same time pollute the air, land, and waters with their discarded materials and by-products. In this regard, the earth's finite resources include also the finiteness of the biosphere and its limited ability to absorb waste products as well.

All of this suggests the urgency with which these problems must be confronted. Man can no longer press onward in the blind belief that he lives in an infinite indestructible world. A re-evaluation of our objectives must be made now.

On the positive side, there are indications that this re-evaluation is beginning to take place. Public opinion is questioning many of the values, attitudes and institutions on which the past successes of Western industrial society rest.

Individuals, corporations, labor organizations, civic groups and governments are mobilizing to conserve resources, to control pollution, to anticipate and prevent environmental problems, to manage land more wisely and to preserve the wilderness. But the program must be on a world-wide scale.

In addressing this momentous issue in the Stockholm Conference on the Human Environment, the United Nations responded to initiatives by Sweden and Canada in which the determination of 113 nations was clearly expressed.

The Declaration on the Human Environment concluded at the Conference contains 26 principles that will serve as guides to lawmakers and governments in the future. One hundred and nine recommendations, some with many parts, constituting an Action Plan for tackling the planet's environmental ills, protecting man and his habitat, and thus enhancing human well-being, were approved at the Conference.

Also, a recommendation for the establishment of new United Nations machinery and an environmental fund to encourage international initiatives was passed.

In Principle 1, the Conference acknowledged that "man has the fundamental right to freedom, equality and adequate conditions of life in an environment of a quality that permits a life of dignity and well-being", and at the same time, it emphasizes that "man has a solemn responsibility to protect and improve the environment for present and future generations."

The Province of Ontario has developed an environmental policy which is in keeping with the two concepts enunciated in this principle.



JAMES VANCE

James Vance honored

James A. Vance of Woodstock, former chairman of the Ontario Water Resources Commission; was recently made an honorary member in the American Society of Civil Engineers.

The honor, the Society's highest, was awarded at the Joint Transportation Engineering Convention in Montreal.

Dr. Vance studied civil engineering at the University of Toronto, and in 1914 on the death of his father, assumed direction of the family's construction company in Woodstock. He is a past president of the Engineering Institute of Canada and a member of the Engineering Advisory Committee of the University of Western Ontario.

He has served as Ontario director of the Canadian Chamber of Commerce and as chairman of the Canadian Forestry Association. A volunteer in public service, he has been on several hospital boards in Woodstock and London, and is a past president of the Oxford County Tuberculosis Association.

Dr. Vance was a member of the Ontario Water Resources Committee prior to being appointed a commissioner in 1956, the year the OWRC was set up by the Ontario government after the committee carried out an intensive investigation of Ontario's water supplies.

Dr. Vance took over as chairman just as the Ontario Water Resources Commission was embarking upon a new phase of its diversified program concerning the provision of adequate pollution control measures in Ontario. The new undertaking involved the building and operation of water pipelines with Ontario government funds in areas where the supply was indicated to be inadequate.

He retired from the Commission in 1969.

Letters to Legacy

One of the last science projects tackled by grades four and five at St. Luke's school in Toronto last school year was pollution.

These are their letters:

Dear Sir:

We are from grade 4 and 5. We are writing to you about our concern of pollution. In Science we are studying on 4 kinds of pollution. They are air pollution, water pollution, litter pollution, and noise pollution. We are writing to you to tell you what we feel about pollution, and what we done.

We went to other classes and asked what they think about pollution, they all said it should be stopped. So that is why we are writing to you. To see if you can do anything about it. If you could write us a letter, we would be very

happy, if you would.

Thank you.

Yours truly

Fernanda Silveira
and Max DeOliveira

Dear Minister:

We went to all the classes in our school, to get some information from the teachers and the children, and this is the information we got from some of the teachers and children.

Miss Zepf—There should be enough garbage cans.

Fernando—There should be tops on sand boxes in the parks.

John Costa—Tell everybody to clean up.

John Diogo—Hire more Garbage man and close the factories that makes most pollution.

Mrs. Rutan—Raising the fines for factories that make pollution.

Mrs. Davy—Stop people from burning things.

Paul Crosswell—Make all glass bottles returnable.

Mrs. Beam—In a h a m—I would ban all cars and make everybody ride T.T.C.

Tony Ferreira—No dogs and cats allowed around the streets.

Emanuel—Set one month aside to pick up garbage.

Eddie—Close down factories and clean up the streets.

George—Invent new ways so there weren't be that much smoking from factories.

M. Hosko—Clean out Lake Ont. and Humber River

—Recycle all glass and paper

—Start a new better transportation system so that people would not have to use their cars as much.

Natalie—Give a dime to each kid that picks up a bag

full of garbage.

Mrs. Keogh—Have strict laws and fines for big business who pollute air and water.

I hope some of these suggestions will be effective.

Your truly

George Alves

Tony Pena

Valdemar Nobre



Ontario

Ministry
of the
Environment

Hon. William G. Newnam,
Minister

Everett Biggs,
Deputy Minister

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Editor - - - - - William M. Dodds
Director of Information Services - - - - - R. J. Frewin